MIYACHI

DC Spot Welding Power Supply

DC-LxxxxA and DC-HxxxxA

Resistance Welders

HARDWARE MANUAL

AMADA®

961-00060 rev12

Annex:
- Safety regulations
- General references on resistance welding
- Contact addresses

Versions		
Version	**Date**	**Basis of Version**
8	2019-01	Conversion to new layout
9	2020-04	Details Update
10	2021-08	Product Name Update
11	2022-06	Product Image Update
12	2023-08	Specification page added

Table of Contents

1 General Information

Information about safety regulations, symbols, copyrights, protection rights, usage location conditions can be found in the back section of these operating instructions.

Please read this information carefully before using these operating instructions.

These operating instructions should help you familiarize yourself with the system and take advantage of its application possibilities when used as directed.

It contains important notes to help operate the unit safely, properly, and economically.

Observing the notes will help avoid risks, decrease repair costs and down times, and enhance reliability and the service life of the unit.

Warning

It is a rule: **Safety first!**

Danger

Incorrect or inappropriate configuration, installation, settings, handling or use can cause mechanical, electrical or thermal hazards, which may result in serious damage or injury.

Ensure the correct execution of these points and follow the respective notes in the operating instructions.

Do not put the system into operation before you have read the **operating instructions**!

Danger

Persons with **cardiac pacemakers** and **metallic implants** are prohibited from approaching to within a radius of **at least 5 m** of welding equipment!

Warning

Crushing Hazard
There is a risk of crushing during the adjustment movement due to closing electrodes, stops for limiting adjustment or stroke movement and the stop on the basic pincers unit for limiting floating movement.

Warning

This **Class A welding equipment** is not supposed to be used in living quarters, where the power supply is carried out by a public low voltage supply.

There it can be difficult to ensure electromagnetic compatibility because of conducted or radiated disturbances.

Warning

Restrictions on use environment conditions

Use this equipment in an environment without conductive dust. If conductive dust enters into equipment, it may cause failure, electric shock or ignition. If using equipment in such environment, consult Amada Weld Tech.

2 Technical Description

2.1 Introduction

Thank you for purchasing this Amada Weld Tech resistance welding power source.

This manual is designed to help the new user to understand and operate the equipment quickly and safely. Please take a few moments to become familiar with the equipment and this manual before attempting to use the equipment.

The following information covers the model you have purchased and others in the range and should be kept for reference. This will also help you identify model specific features mentioned in this manual.

All DC-LxxxxAs and DC-HxxxxAs are comprised of a linear DC power unit controlled by a microprocessor and colour touch screen interface.

It is the user's responsibility to ensure that their installation is safe both electrically and mechanically.

The DC-LxxxxA/DC-HxxxxA allows you to program the delivery of electrical energy into a weld by allowing adjustment of time and amplitude. Typically, energy into the weld is gradually ramped up, held at a peak and then reduced. The amount of energy will depend on the length of these times together with the value of the peak amplitude achieved. In some cases it is beneficial to use 2 pulses in a weld, usually with the first pulse acting as a means of pre-conditioning the parts.

A weld profile that is used to make a satisfactory weld can be saved as a PROFILE in the unit's memory.

3 Commissioning

3.1 Electrical Connections

Caution

DO **Use a properly rated Mains Service Supply**
An identification plate on the rear panel specifies the input mains voltage requirement.

DO **Provide Proper Ventilation**

DO **Use Lifting Gear to Move the Unit**

DO NOT **Operate Machine Without Covers**

DO NOT **Operate With Suspected Failures**

DO NOT **Operate in an Explosive Atmosphere**

DO NOT **Operate in Wet/Damp Conditions**

IF IN DOUBT, CONTACT YOUR DISTRIBUTOR

Inspect the unit for any shipping damage prior to connecting to the mains supply.

This product MUST be connected to the correct mains supply voltage. Refer to the identification plate located on the rear panel.

Single-Phase

Cable Colour:	
Brown	Live
Blue	Neutral
Yellow/Green	Safety Earth / Ground

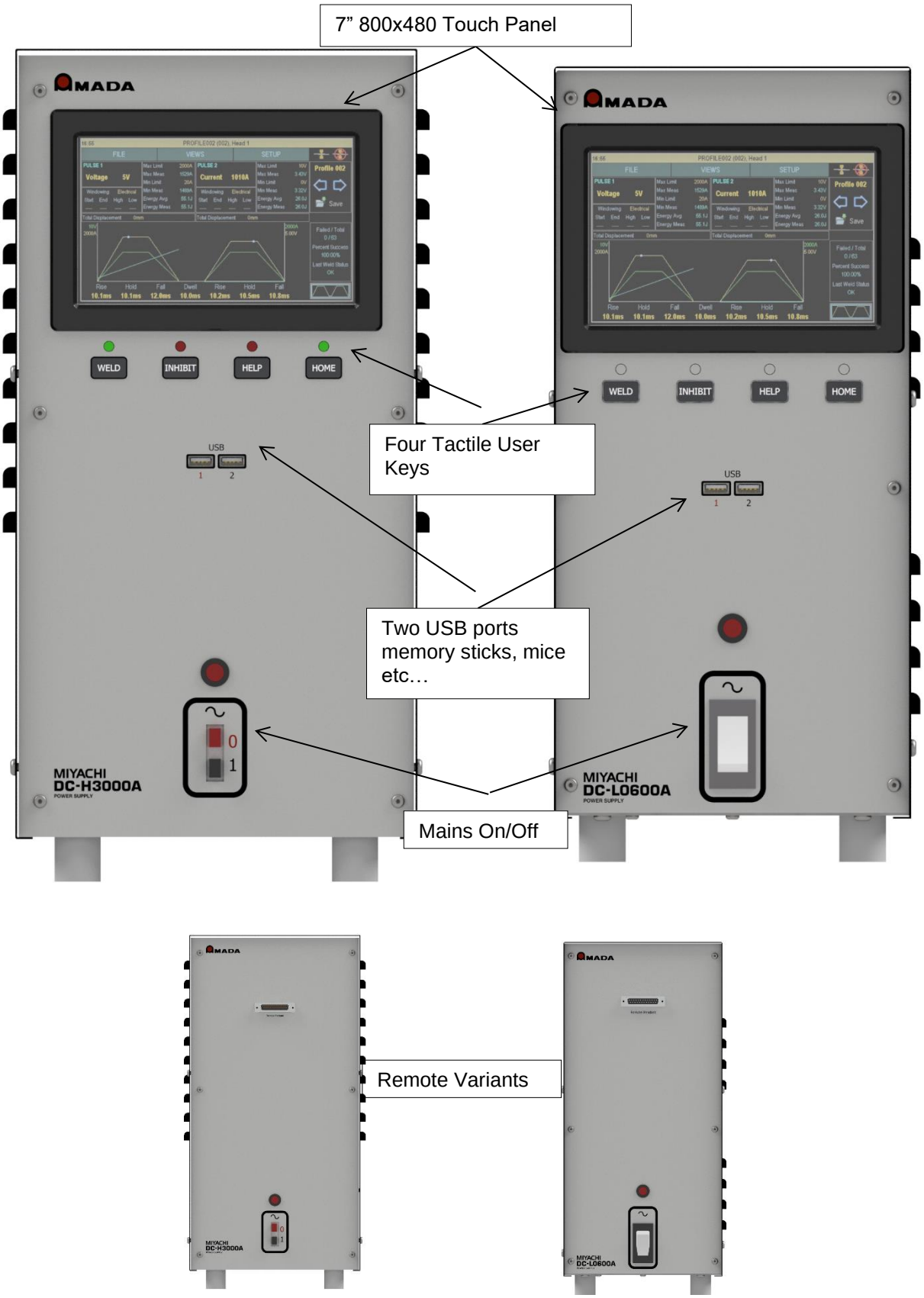
3-Phase

Cable Colour:	
Black	Line 1
Black	Line 2
Black	Line 3
Yellow/Green	Safety Earth / Ground

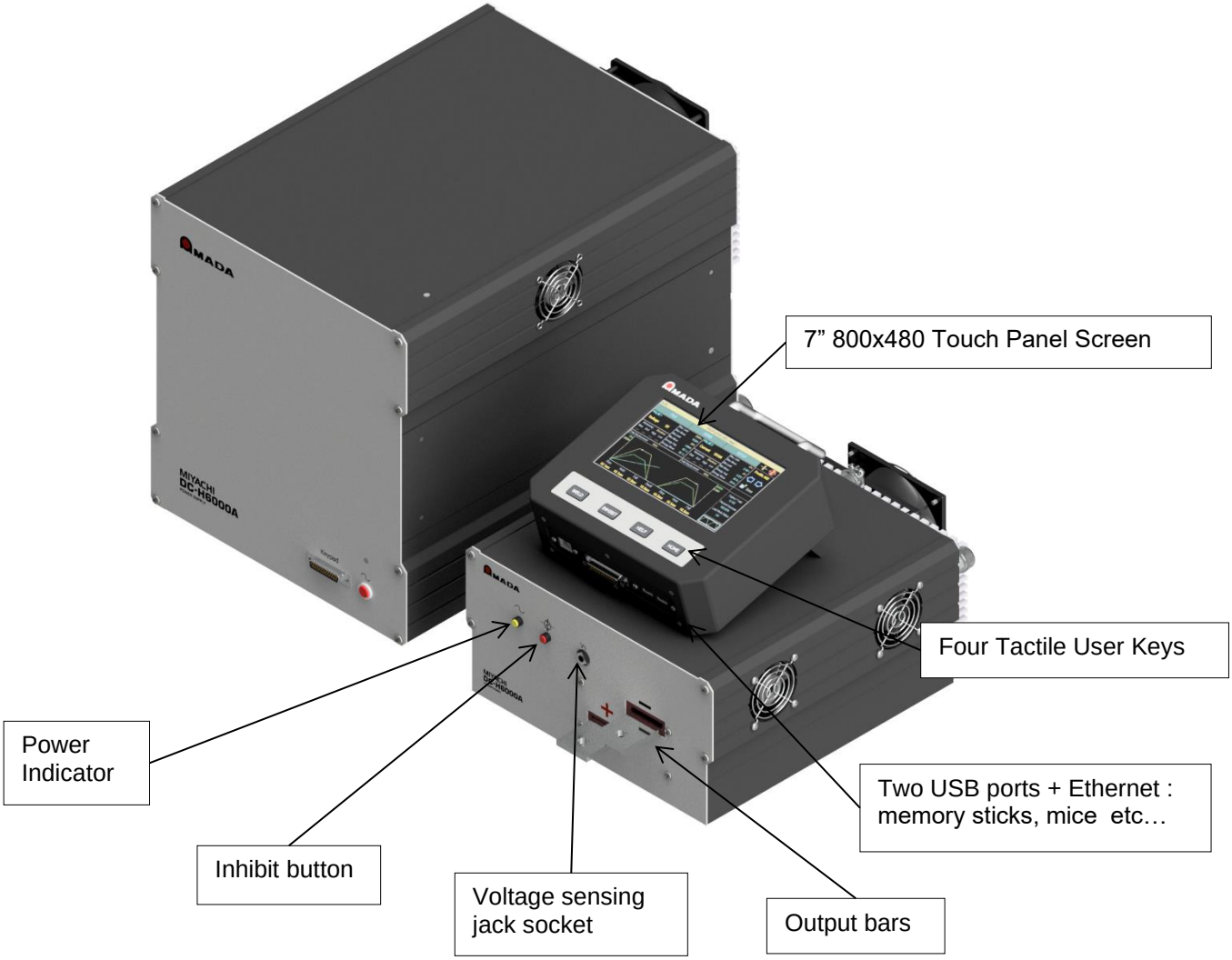
Ensure a good earth / ground connection is provided for operator safety. The internal electrical circuits are floating, so an additional earth / ground connection can be made to one output lug or on one side of the weld head. The unit will not operate with both the positive and negative outputs grounded.

4 Preparation and Installation

4.1 DC-LxxxxA and DC-H3000A Front

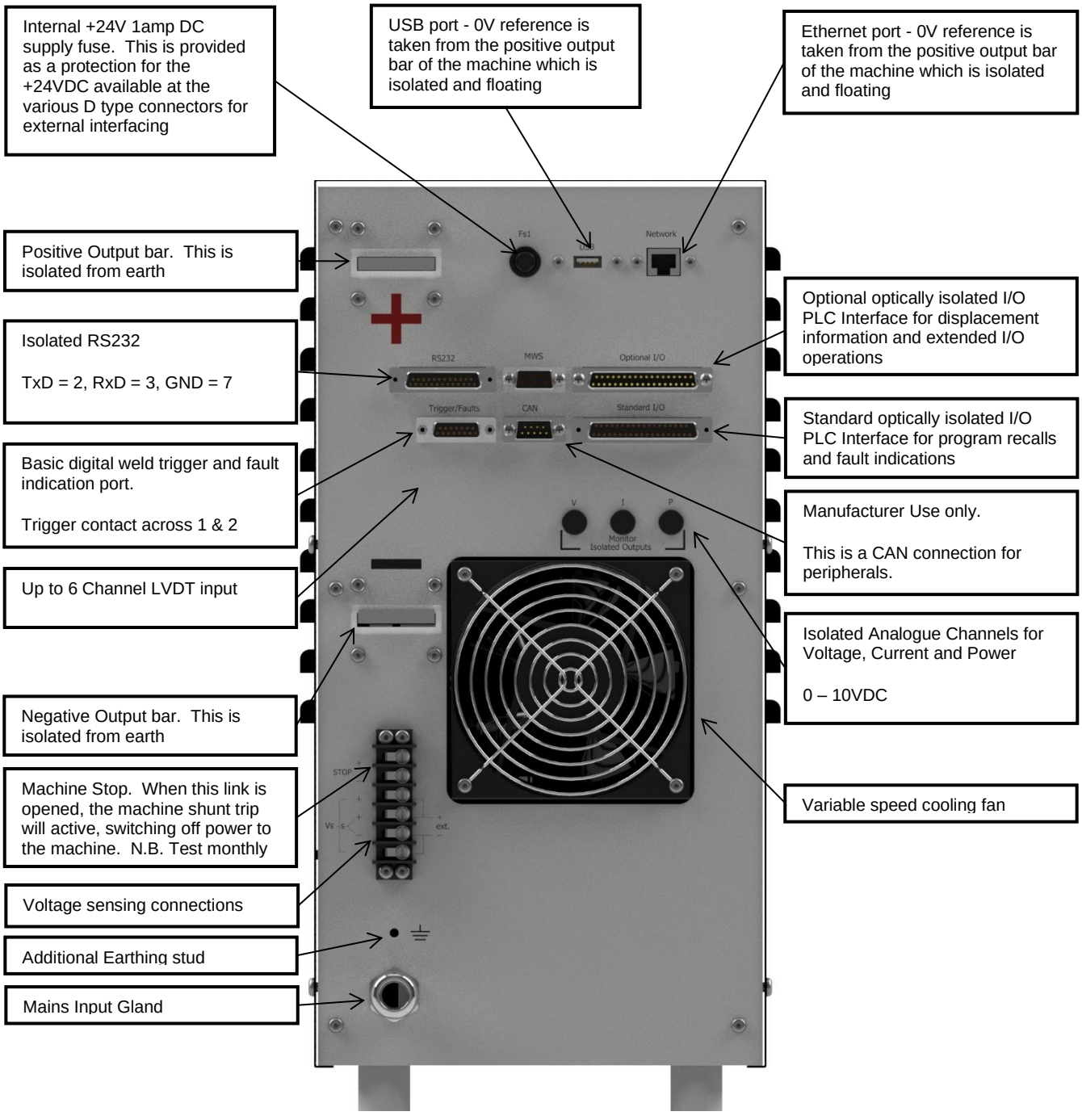


4.2 DC-H6000A Front



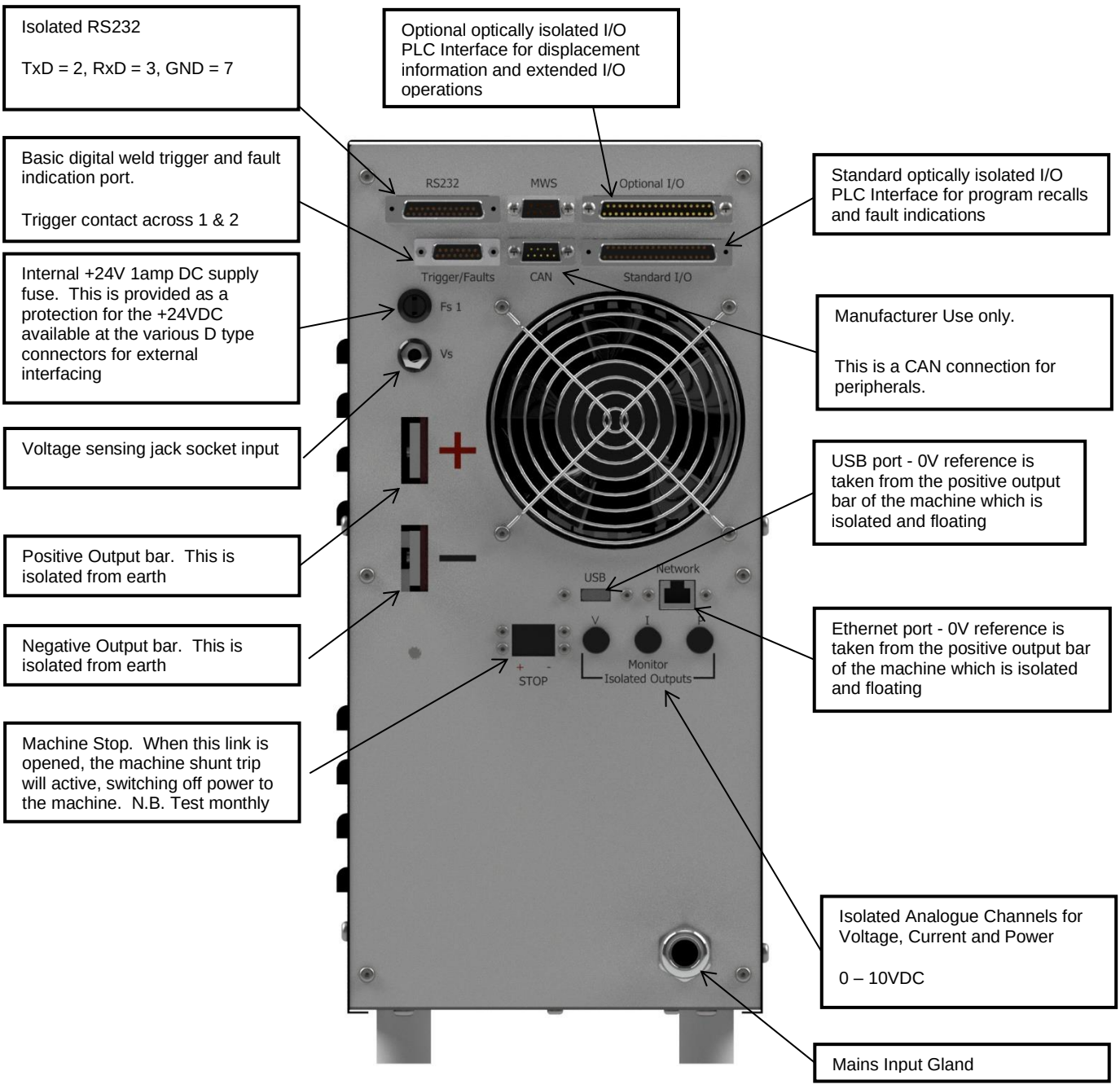
4.3 Rear Connections

The photo below shows the rear panel connections of a DC-H3000A



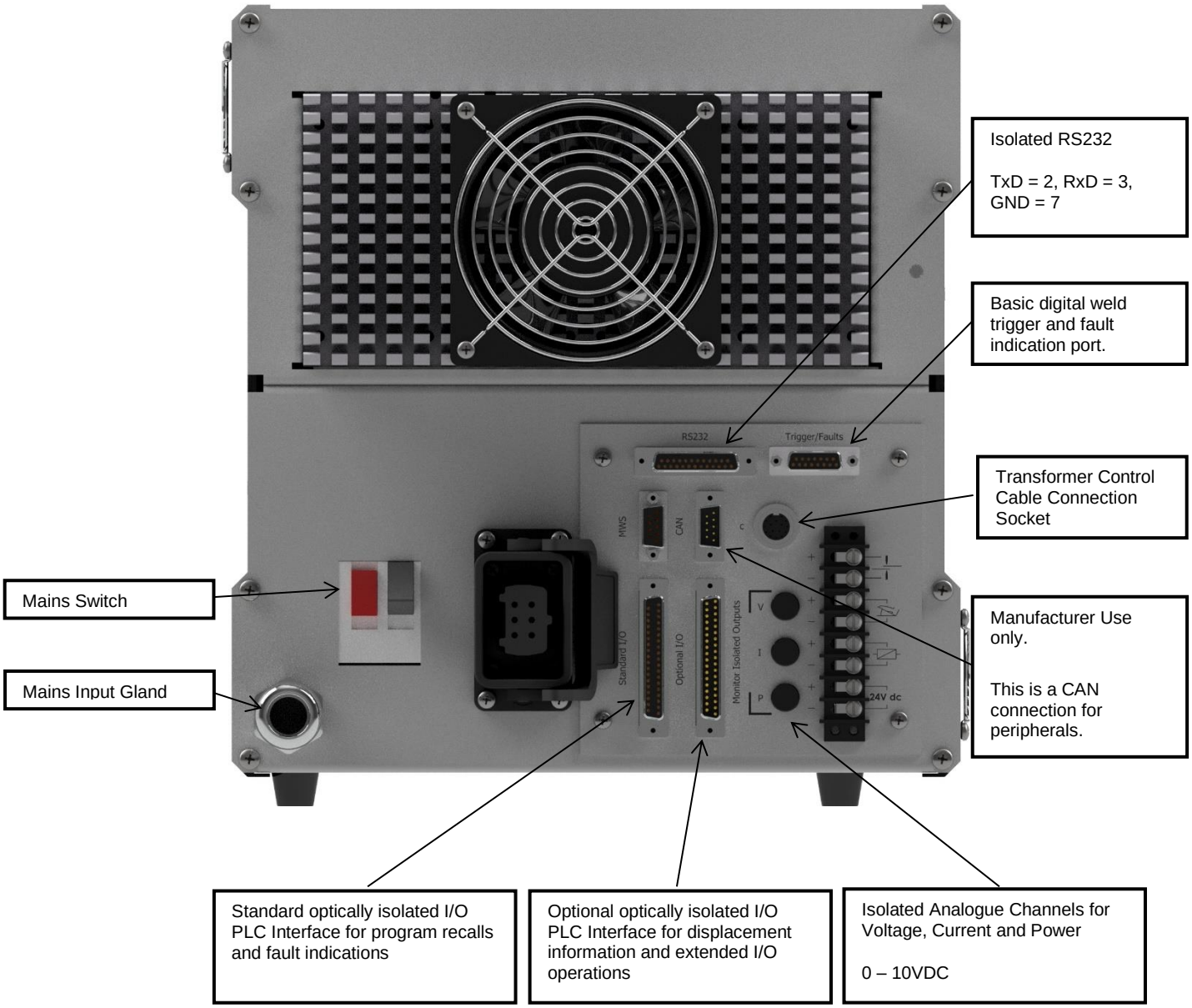
(Not all connectors are present on all configurations)

The photo below shows the rear panel connections of a DC-L0600A or DC-L1000A



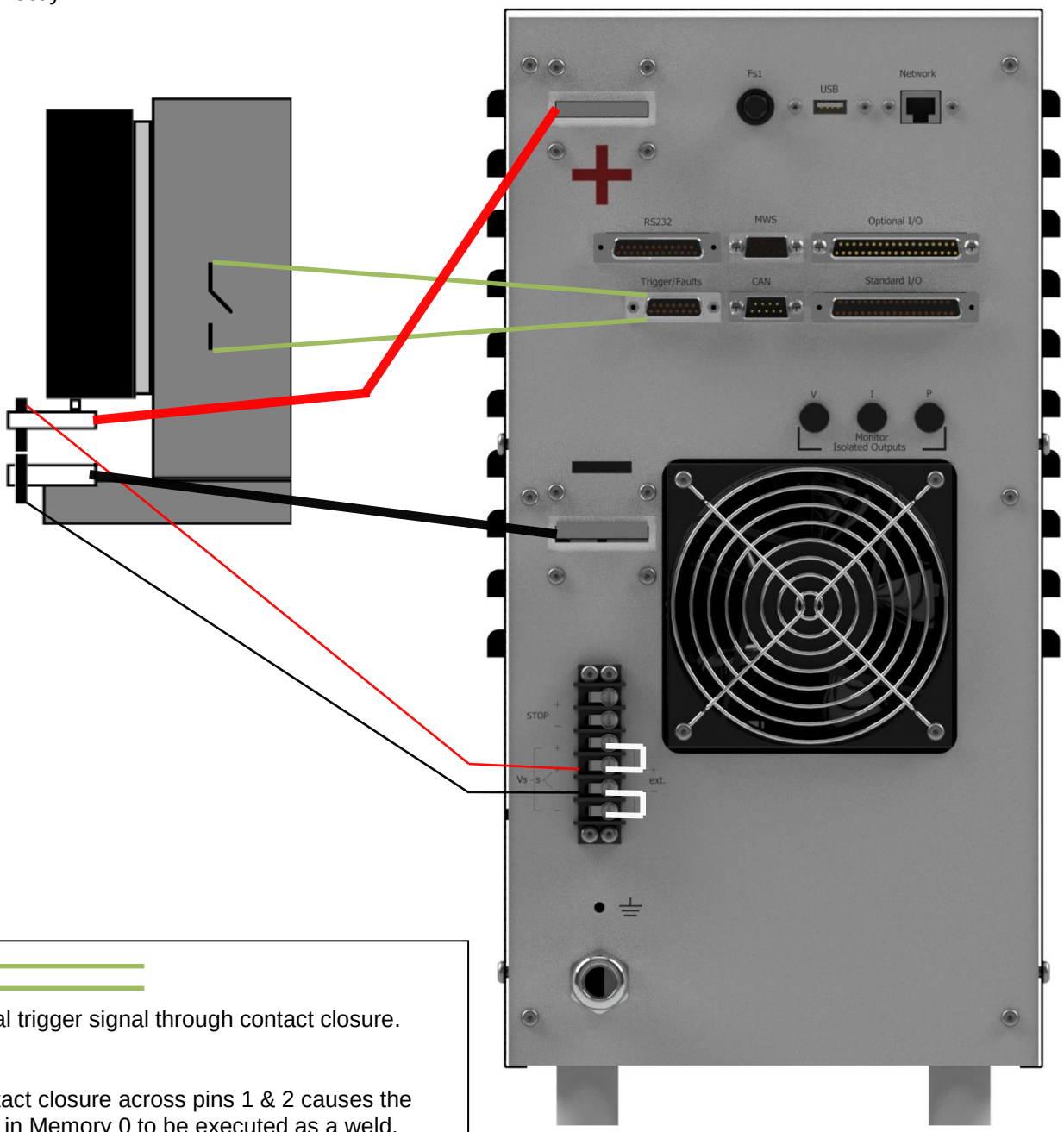
(Not all connectors are present on all configurations)

The photo below shows the rear panel connections of a DC-H6000A range welder



(Not all connectors are present on all configurations)

Before attempting to use this power supply ensure the mains is OFF and the welder is connected correctly.



Manual trigger signal through contact closure.

A contact closure across pins 1 & 2 causes the profile in Memory 0 to be executed as a weld. Note, these pins use the internal +24VDC PSU in order to trigger an opto isolator internally.

Welding cables should be connected as shown, although polarity may depend upon welding conditions.

As a general rule, a 50mm^2 cable will drop approximately 0.5V per 1 metre length of cable.

For external voltage sensing (preferred connection method) at the weld , remove the two links as shown on the connector block (right) and connect the external leads as shown.

When fitted, these links connect the voltage sensing circuit to the output bars of the machine.

The voltage sensing system is polarity tolerant. It can also be used to detect a missing voltage sensing lead.

5 Rear Panel Connections

5.1 Standard IO Isolated Interface

The following tables show the standard outputs and inputs available at the 37W D type PLC interface socket.

24V 20mA nominal rating - - Inputs and Outputs ARE fully protected against short circuit and overload.

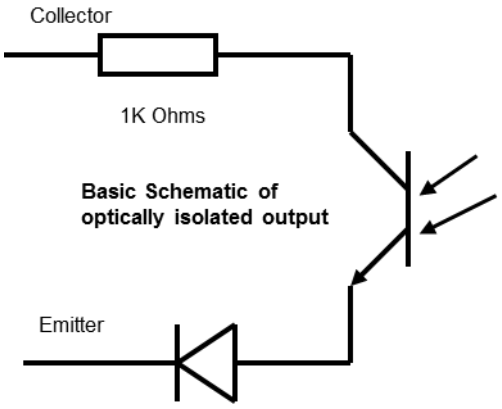
Also shown are the available initial IO configurations. Note that it is now possible to modify these configurations if desired. This includes changing whether outputs are asserted high/low on activation and on whether inputs are triggered on high-low or low-high transitions. For more details, see the software manual IO Configuration section.

5.1.1 Standard Outputs

Output	Description	D-type Pin Number
Standard Output #1	Collector	28
	Emitter	17
Standard Output #2	Collector	10
	Emitter	35
Standard Output #3	Collector	29
	Emitter	36
Standard Output #4	Collector	11
	Emitter	13
Standard Output #5	Collector	12
	Emitter	15
Standard Output #6	Collector	31
	Emitter	32
Standard Output #7	Collector	33
	Emitter	34
Standard Output #8	Collector	14
	Emitter	16

Typically, the collector connection is pulled up to +24VDC (obtained on pin 37) and is used as the input to a PLC, while the emitter is connected to 0V(+24RTN), obtained on pin 19.

Passing current activates the output.

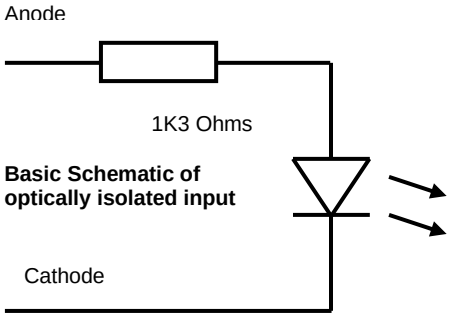


5.1.2 Standard Inputs

Input	Description	D-type Pin Number
Standard Input #1	Anode	21
	Cathode	27
Standard Input #2	Anode	3
	Cathode	8
Standard Input #3	Anode	1
	Cathode	26
Standard Input #4	Anode	22
	Cathode	7
Standard Input #5	Anode	4
	Cathode	5
Standard Input #6	Anode	20
	Cathode	24
Standard Input #7	Anode	2
	Cathode	6
Standard Input #8	Anode	23
	Cathode	25
Externally available 24V	+24VDC	37
	0V (24 RTN)	19
Remote Reset	Anode (must be volt-free)	18*
	Cathode (internally hardwired to 0V pin 19)	

Typically, the anode is connected directly to +24VDC (obtained on pin 37) while the cathode is connected via a PLC or switch to 0V(+24RTN), obtained on pin 19.

Passing current activates the input.

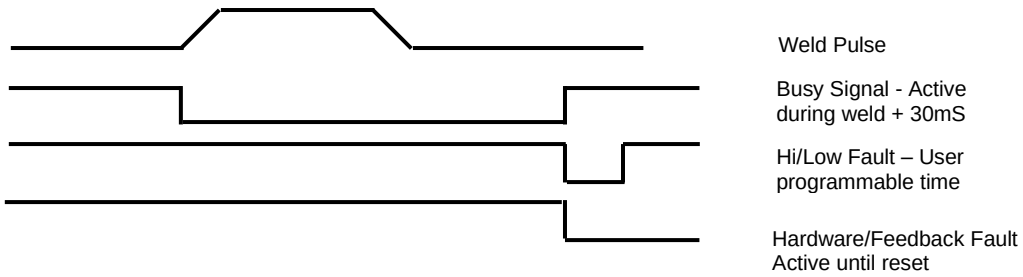


5.1.3 Default Configuration

Output	Description	Pins
Standard Output #1	Fault High Limit	28, 17
Standard Output #2	Fault Low Limit	10, 35
Standard Output #3	BCD Value 4	29, 36
Standard Output #4	Feedback Fault	11, 13
Standard Output #5	BCD Value 1	12, 15
Standard Output #6	BCD Value 2	31, 32
Standard Output #7	Busy	33, 34
Standard Output #8	Inhibit Status	14, 16

The BCD outputs are used to select channels when configured for electrical distribution with MacGregor distribution units. These outputs turn ON the opto transistor when selected. All fault outputs and the busy output turn OFF the opto-transistor when active.

A typical timing diagram of selected outputs might look as follows:



Input	Description	Pins
Standard Input #1	Recall Store 0 (display)	21, 27
Standard Input #2	Recall Store 1	3, 8
Standard Input #3	Recall Store 2	1, 26
Standard Input #4	Recall Store 3	22, 7
Standard Input #5	Recall Store 4	4, 5
Standard Input #6	Recall Store 5	20, 24
Standard Input #7	Recall Store 6	2, 6
Standard Input #8	Recall Store 7	23, 25

5.1.4 DS Option Configuration

Output	Description	Pins
Standard Output #1	Fault BCD Code 0	28, 17
Standard Output #2	Inhibit Status	10, 35
Standard Output #3	Fault BCD Code 3	29, 36
Standard Output #4	Feedback Fault	11, 13
Standard Output #5	Fault BCD Code 1	12, 15
Standard Output #6	Fault BCD Code 2	31, 32
Standard Output #7	Busy	33, 34
Standard Output #8	Spare	14, 16

Input	Description	Pins
Standard Input #1	Recall Store 0 (display)	21, 27
Standard Input #2	Spare	3, 8
Standard Input #3	Reset (Stop Welder)	1, 26
Standard Input #4	Trigger	22, 7
Standard Input #5	Recall BCD 0	4, 5
Standard Input #6	Recall BCD 1	20, 24
Standard Input #7	Recall BCD 2	2, 6
Standard Input #8	Recall BCD 3	23, 25

The following specifies the functionality for the DS Isolated Interface:

The software has been enhanced to provide up to 15 error codes which are output via the optically isolated output pins in a BCD code format. These error codes are held at the output until the RESET signal is applied. The Fault Hardware Interrupt signal is also cleared in this fashion using the RESET signal.

The fault conditions are summarised below.

Output Code	Fault Description
0	No fault
1	Pulse 1 High Limit
2	Pulse 1 Low Limit
3	Pulse 2 High Limit
4	Pulse 2 Low Limit
5	Low Limit Pulse 1 and High Limit Pulse 2
6	Low Limit Pulse 1 and Low Limit Pulse 2
7	High Limit Pulse 1 and Low Limit Pulse 2
8	High Limit Pulse 1 and High Limit Pulse 2
9	Output Stage Temperature Error
10	24 VDC Error (Missing 24 VDC)
11	Missing Input Phase(s) (Only Active on DC1001P / DC1801P)
12	Missing Voltage Sensing Lead
13	reserved
14	reserved
15	reserved

5.1.5 BCD Option Configuration

Output	Description	Pins
Standard Output #1	BAD Weld	28, 17
Standard Output #2	Good Weld	10, 35
Standard Output #3	BCD Value 4	29, 36
Standard Output #4	Feedback Fault	11, 13
Standard Output #5	BCD Value 1	12, 15
Standard Output #6	BCD Value 2	31, 32
Standard Output #7	Busy	33, 34
Standard Output #8	Inhibit Status	14, 16

Input	Description	Pins
Standard Input #1	Recall Store 0 (display)	21, 27
Standard Input #2	Spare	3, 8
Standard Input #3	Reset (Stop Welder)	1, 26
Standard Input #4	Trigger	22, 7
Standard Input #5	Recall BCD 0	4, 5
Standard Input #6	Recall BCD 1	20, 24
Standard Input #7	Recall BCD 2	2, 6
Standard Input #8	Recall BCD 3	23, 25

Outputs are identical to the default configuration apart from the Good/Bad weld indicators. One of these is activated after each weld. Inputs are identical to the DS option configuration.

5.2 Optional IO Isolated Interface

The following tables show the expanded outputs and inputs available at the optional extra 37W D type PLC interface socket.

24V 20mA nominal rating - - Inputs and Outputs ARE fully protected against short circuit and overload.

Operation of the outputs and inputs is identical to the standard IO.

5.2.1 Optional Outputs

Output	Description	D-type Pin Number
Optional Output #1	Collector	1
	Emitter	20
Optional Output #2	Collector	2
	Emitter	21
Optional Output #3	Collector	3
	Emitter	22
Optional Output #4	Collector	4
	Emitter	23
Optional Output #5	Collector	5
	Emitter	24
Optional Output #6	Collector	6
	Emitter	25
Optional Output #7	Collector	7
	Emitter	26
Optional Output #8	Collector	8
	Emitter	27

5.2.2 Optional Inputs

Input	Description	D-type Pin Number
Optional Input #1	Anode	9
	Cathode	13
Optional Input #2	Anode	28
	Cathode	32
Optional Input #3	Anode	10
	Cathode	14
Optional Input #4	Anode	29
	Cathode	33
Optional Input #5	Anode	11
	Cathode	15
Optional Input #6	Anode	30
	Cathode	34
Optional Input #7	Anode	12
	Cathode	16
Optional Input #8	Anode	31
	Cathode	35

5.2.3 Default Configuration

Output	Description	Pins
Optional Output #1	Spare	1, 20
Optional Output #2	Spare	2, 21
Optional Output #3	Remote Inhibit	3, 22
Optional Output #4	Displacement Max Fault	4, 23
Optional Output #5	Displacement Min Fault	5, 24
Optional Output #6	Displacement Condition Fault	6, 25
Optional Output #7	Displacement Oversize Fault (pre-weld)	7, 26
Optional Output #8	Displacement Undersize Fault (pre-weld)	8, 27

Note that all fault outputs turn OFF the opto-transistor.

Input	Description	Pins
Optional Input #1	New Electrode Input 1	9, 13
Optional Input #2	Reset HW	28, 32
Optional Input #3	Toggle Inhibit	10, 14
Optional Input #4	New Electrode Input 2	29, 33
Optional Input #5	New Electrode Input 3	11, 15
Optional Input #6	New Electrode Input 4	30, 34
Optional Input #7	New Electrode Input 5	12, 16
Optional Input #8	New Electrode Input 6	31, 35

5.2.4 BCD Option Configuration

Output	Description	Pins
Optional Output #1	Remote Inhibit	1, 20
Optional Output #2	Head Retract Status (smart head systems only)	2, 21
Optional Output #3	Pre-Weld Fault (oversize/undersize)	3, 22
Optional Output #4	Good Weld	4, 23
Optional Output #5	BAD Weld	5, 24
Optional Output #6	Smart Weld Head Fault	6, 25
Optional Output #7	Smart Head System Fault	7, 26
Optional Output #8	Displacement Fault	8, 27

Input	Description	Pins
Optional Input #1	New Electrode Input 1	9, 13
Optional Input #2	Reset HW	28, 32
Optional Input #3	Toggle Inhibit	10, 14
Optional Input #4	New Electrode Input 2	29, 33
Optional Input #5	Retract Head (smart head systems only)	11, 15
Optional Input #6	New Electrode Input 4	30, 34
Optional Input #7	New Electrode Input 5	12, 16
Optional Input #8	New Electrode Input 6	31, 35

5.2.5 Program Echo Configuration

Output	Description	Pins
Optional Output #1	Remote Inhibit	1, 20
Optional Output #2	Weld Head 1	2, 21
Optional Output #3	Weld Head 2	3, 22
Optional Output #4	Program Echo Bit 0	4, 23
Optional Output #5	Program Echo Bit 0	5, 24
Optional Output #6	Program Echo Bit 0	6, 25
Optional Output #7	Program Echo Bit 0	7, 26
Optional Output #8	Spare	8, 27

The Program Echo lines form a BCD pattern which echoes back to the PLC the BCD input pattern, indicating which profile was selected to weld with (1 to 15).

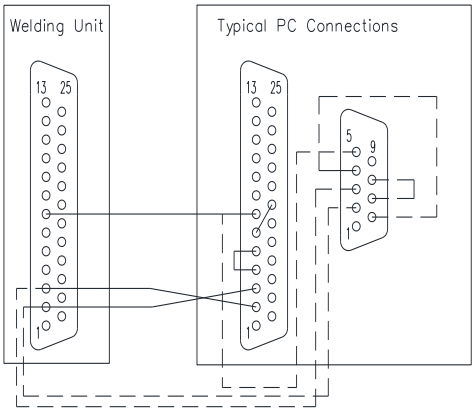
Input	Description	Pins
Optional Input #1	New Electrode Input 1	9, 13
Optional Input #2	Reset HW	28, 32
Optional Input #3	Toggle Inhibit	10, 14
Optional Input #4	New Electrode Input 2	29, 33
Optional Input #5	New Electrode Input 3	11, 15
Optional Input #6	New Electrode Input 4	30, 34
Optional Input #7	New Electrode Input 5	12, 16
Optional Input #8	New Electrode Input 6	31, 35

5.3 Isolated RS232

The 25 Way D type connector provides an optically isolated RS232 communications port.

Connections are as follows;

TXD pin 2
RXD pin 3
0V pin 7



5.4 Connecting a Typical PC Port

A PC uses either a 9-pin D-type serial connector or a 25-pin D-type. The table below shows how to interface the m3 to either type of PC serial communication port. (Handshake lines CTS,RTS, DSR & DTR can usually be omitted.

Comms signal description	25-pin comms port	9-pin comms port	Connection required	25-pin connector 'b' (m3)
Protective ground	pin 1	pin 5		
Tx	pin 2	pin 3	→	pin 3 (Rx)
Rx	pin 3	pin 2	→	Pin 2 (Tx)
RTS	pin 4	pin 7	←	
CTS	pin 5	pin 8	←	
DSR	pin 6	pin 6	←	
Logical Ground	pin 7	pin 5	→	pin 7 (isolated 0V)
DTR	pin 20	pin 4	←	

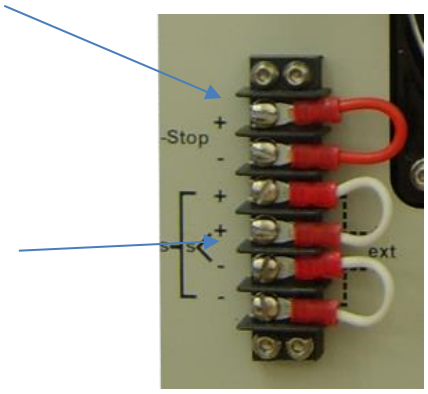
5.5 15 way Trigger/Fault D type

A 15W D type socket is fitted on many machine variants to provide the following useful signals and indicators.

FUNCTION		Pins	
Remote weld trigger (of store 0) by contact closure		1 2	Pin 1 is hardwired to 0V (pin14) and pin 2 is the cathode connection for store 0 ** **NB ** This is NOT isolated from the internal 24v supply**
Normally open contacts used to indicate a fault condition		4 5	The relay contacts rating is 24V at 0.5A The contacts close for a Feedback Fault.
Remote fault reset by contact closure		7 8	Pin 8 is hardwired to +24VDC (pin 15) and pin 7 is the anode connection for this input
Externally available power supply	0V	14	Protected by fuse Fs2 in the rear panel rated at 1A anti-surge type T
	24VDC	15	

5.6 Voltage Sensing and Stop

The optional STOP link may be used to disengage the mains switch trip to disconnect mains power inside the unit. A contact closure across these terminals maintains the power supply.



Some machines utilise a screw terminal strip for voltage sensing. The two centre screws + & - are connected internally to the output bars of the machine. Other machines may use a jack socket for sensing.
The outer two screw connections are connected internally to the voltage sensing electronics.
Thus, for internal voltage sensing, two links must be fitted as shown.
For external voltage sensing, the inner two screw connections are taken to the electrodes for voltage sensing

5.7 Isolated Analogue Outputs

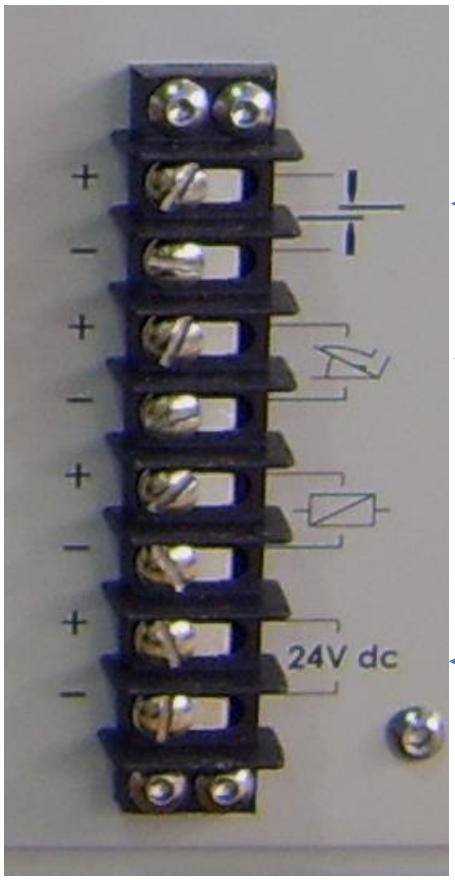
Optionally, some units are provided with 3 channels of optically isolated analogue output monitoring. The three process parameters, voltage, current and power are internally isolated and fed to rear panel BNC connectors for direct connection to an oscilloscope.

5.8 Ethernet, USB and FS1

FS1 is a 2 amp anti surge fuse that protects the internal +24V power supply. Failure of this fuse will result in power supply malfunction. Since +24VDC is distributed to the external rear connectors, be sure to check and clear any faults before replacing this fuse.

There are 3 a non isolated USB connectors on the unit. Two at the front and one on the rear panel. The USB connections are referenced to the machine internal 0V, which is floating and is at the same potential as the positive output bar. The shield/earth connections are also floating. Thus keyboards, mice and memory sticks may be connected into these points.

5.9 Quick Connection Strip



Trigger weld by shorting + & -

Foot switch connection point – When shorted, +24V is applied to the solenoid connections

Solenoid connection point

Isolated +24VDC supply for solenoid and opto isolator driving.

1 amp max

6 Fault Codes and Warnings

The machine will also produce a FAULT CODE and brief description for various types of fault.
These are listed as follows :-

Fault	Description	Remedy
ERROR 1	FEEDBACK FAULT.	Check connections
FAULT 2	PULSE 1 UNDER LOW LIMIT	Check Limit Settings
FAULT 3	PULSE 1 FAILED BOTH LIMITS	Check Limit Settings
FAULT 4	PULSE 1 OVER HIGH LIMIT	Check Limit Settings
FAULT 5	PULSE 2 UNDER LOW LIMIT	Check Limit Settings
FAULT 6	PULSE 2 FAILED BOTH LIMITS	Check Limit Settings
FAULT 7	PULSE 2 OVER HIGH LIMIT	Check Limit Settings
FAULT 8	PULSE 1 UNDER LOW LIMIT AND PULSE 2 UNDER LOW LIMIT	Check Limit Settings
FAULT 9	PULSE 1 UNDER LOW LIMIT AND PULSE 2 FAILED BOTH LIMITS	Check Limit Settings
FAULT 10	PULSE 1 UNDER LOW LIMIT AND PULSE 2 OVER HIGH LIMIT	Check Limit Settings
FAULT 30	PULSE 1 OVER HIGH LIMIT AND PULSE 2 OVER HIGH LIMIT	Check Limit Settings
FAULT 31	PULSE 1 FAILED BOTH LIMITS AND PULSE 2 OVER HIGH LIMIT	Check Limit Settings
FAULT 32	PULSE 1 FAILED BOTH LIMITS AND PULSE 2 UNDER LOW LIMIT	Check Limit Settings
FAULT 33	PULSE 1 FAILED BOTH LIMITS AND PULSE 2 FAILED BOTH LIMITS	Check Limit Settings
FAULT 34	PULSE 1 OVER HIGH LIMIT AND PULSE 2 UNDER LOW LIMIT	Check Limit Settings
FAULT 35	PULSE 1 OVER HIGH LIMIT AND PULSE 2 FAILED BOTH LIMITS	Check Limit Settings
FAULT 36	PRE WELD VOLTAGE SENSING TEST FAILED. CHECK CONNECTION OF VOLTAGE SENSING LEADS.	Check VS leads

Screen Warnings		
Fault	**Description**	**Remedy**
	WARNING TOTAL PULSE TIME EXCEEDS 100MS. ENSURE PEAK DEMAND IS SET TO A REASONABLE VALUE TO PREVENT ANY DAMAGE TO THE POWER SUPPLY	Be sure to check the power level is within the duty rating
	WARNING THREE PHASE FAILURE DETECTED. CONTACT SERVICE ENGINEER IMMEDIATELY	Check wiring/mains
	WARNING OUTPUT INHIBITED.	Check control cables and circuit breakers
	WARNING OUTPUT STAGE TEMPERATURE ERROR.	Check that the fans are operating and that the vents are not obstructed
	WARNING OUTPUT TRANSFORMER TEMPERATURE ERROR. (M3-40/M3-60 ONLY)	Check that the fans are operating and the vents are not obstructed
	WARNING OUTPUT STAGE AND OUTPUT TRANSFORMER TEMPERATURE ERRORS.	Check that the fans are operating and the vents are not obstructed
	WARNING MAIN TRANSISTOR TEMPERATURE ERROR.	Check that the fans are operating and the vents are not obstructed

7 Trouble Shooting Guide

The following section has been prepared as a basic checklist to use in the event of the system problem. The design and reliability of the products is such that power supply failure itself is extremely rare.

More often than not, a system problem will be caused by a change in the overall process in which the power supply is used. It is therefore **VERY IMPORTANT** to consider the variables that may affect the welding process and to be sure that these are under control, before suspecting a problem with the power supply.

Typical process changes maybe

1. An electrode change; dirty or damaged electrodes
2. Dimensional changes in product
3. Material quality, e.g. Oxide layer, substrate thickness etc...
4. Faulty weld heads

If these aspects have been considered, then the following checklist should be worked through. Most machines provide a level of fault reporting with error codes and rudimentary help. Before making changes, it is advisable to record all of the process settings if possible.

Check / Symptom	**Reasons**	**Remedy**
Is the power on indicator illuminated ?	This LED illuminates to show the machine is ON and that the internal +24VDC supply is functioning	Check rear panel fuse (if fitted). Disconnect ALL external connections. *(It is quite common for external wiring faults to cause the +24VDC supply to be overloaded)* Check mains fuse Check mains supply to machine
Is the main display illuminated?	The machine display will illuminate ONLY if the +15V internal supply is good	Check rear panel fuses Check mains supply to machine Check mains fuse
Machine is on, but no output	The machine output will be inhibited if the machine overheats or suffers a feedback fault.	Clear the fault & inhibit Allow machine to cool down and investigate reasons for over heating Check output connections.
Machine is on, but no output (using distribution electronics)	Loss of output maybe caused by either the power supply or the distribution electronics	If using distribution, disconnect the distribution electronics and connect a load across the welder directly. Try a sample weld pulse.
Machine continually produces a HARDWARE/FEEDBACK fault	This occurs when the machine loses the measurement feedback used for control - The most common problem is broken voltage feedback wires. Similar faults also occur when electrodes have been replaced or modified incorrectly.	A quick check for voltage sensing feedback is to try a weld with internal sensing by disconnecting the leads and fitting links or by unplugging the voltage sensing jack socket. Check electrode contact
Machine continually produces a HARDWARE/FEEDBACK fault (using distribution electronics)	The fault must be traced to either the power supply or the distribution electronics.	If using distribution, disconnect the distribution electronics and connect a load across the welder directly. Try a sample weld pulse.

Check / Symptom	Reasons	Remedy
No RS232 communication	Problems generally occur with incorrect wiring or incompatible software	Check connections, particularly Tx & Rx
Machine continually exceeds upper or lower limits	Often caused by variations in electrode, particularly when new	Run several trial welds and check electrode alignment. Operate machine in constant current mode in order to rule out voltage feedback problems. Locate cause of voltage feedback problem
Machine starts, but displays UNABLE TO ESTABLISH COMMS	This occurs if the incompatible software is fitted	Fit correct software
Machine will not trigger	Most often caused by loss of +24VDC Alternatively, suspect wiring	Check fuse and wiring

8 Technical Specification

	DC-L0600A	DC-L1000A	DC-H3000A	DC-H6000A (Power Supply)	DC-H6000A (Transformer)
Output	4V @1000Amps DC	4V @1000Amps DC	6V @3000Amps DC	5V @6000Amps DC	
Duty Cycle	3% @1000Amps	5% @1000Amps	3% @3000Amps	5% @6000Amps	
Accuracy	Within +/-1%				
Cooling	Air-cooled with over temperature protection				
Permissible Humidity	Max 70%, non- condensing				
Ambient Temperature	Max 40 degree Celsius				
Data Retention	Memory backup 10 years				
Dimensions **Depth**	440mm	440mm	540mm	630mm	440mm
Width	205mm	205mm	240mm	450mm	320mm
Height	430mm	430mm	470mm	250mm	170mm
Weight	26Kg	65Kg	38Kg	34Kg	18Kg
Supply Rating	110-240vac +/-10% 50/60Hz 1 phase	208-480vac +/-10% 50/60Hz 3 phase (factory selected)	380-480vac +/-10% 50/60Hz 3 phase (factory selected)	380-480vac +/-10% 50/60Hz 3 phase (factory selected)	
	Please refer to machine serial number plate for power rating				

9 Index

9.1 Headword Index